wherein the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed.

A marked-up version of the amended claims is enclosed as required by 37 C.F.R. § 1.121.

REMARKS

The Office Action dated November 6, 2002 has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. By this Amendment, claim 1 has been amended to correct minor grammatical errors. No new matter has been added or amendments made that narrow the scope of any elements of any claims. The claim changes are merely cosmetic in nature. Accordingly, claims 1-7 are pending in this application and are submitted for consideration.

Claim 1 was objected to for minor grammatical errors. By this amendment claim 1 has been amended. Therefore, the objection is requested to be withdrawn.

Claims 1, 4, 6 and 7 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tanaka et al. (U.S. Patent No. 5,956,947, "Tanaka"). However, Applicants respectfully submit that claims 1, 4, 6 and 7 recite subject matter that is neither disclosed nor suggested in Tanaka.

Claim 1 recites an exhaust emission control system of an internal combustion engine for cleaning exhaust gases discharged from the internal combustion engine including an exhaust system defining a main exhaust passage connected to an internal combustion engine, and a bypass exhaust passage which branches off and joins back to the main exhaust passage. A switching device switching an exhaust gas flow path to either of the main exhaust passage and the bypass exhaust passage. An adsorbent material disposed within the main exhaust passage for adsorbing unburned constituents of exhaust gases introduced into the main exhaust passage and releasing the unburned constituents as temperature increases. A control device operable to control the switching device. The control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material absorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage when the adsorbed unburned constituents is released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage only when a release of the adsorbed unburned constituents is completed.

In making this rejection, the Office Action took the position that Tanaka discloses all of the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the structure of the claimed invention, and therefore, fails to provide the advantages of the present invention. For example, in the exhaust emission control system of the present invention, the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage when the adsorbed unburned constituents is

released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed.

As a result of the claimed configuration, the exhaust gas flow path is switched to the main exhaust passage all the time, except while the unburned constituents are allowed to be released from the adsorbent material, i.e., almost all the time while the internal combustion engine is in operation, so that the exhaust gases are allowed to flow through the main exhaust passage. Even if deposits such as soot are deposited in the adsorbent material when the exhaust gases pass through the adsorbent material, the adsorbent material is put in a highly heated state by the highly heated exhaust gases which flows through the main exhaust passage, and the deposits are burned with oxygen left unused in the exhaust gases due to fuel cuts taking place while the internal combustion engine is in operation, whereby the deposits can be removed from the adsorbent material. In addition, the frequency at which the switching device performs the switching operation can remarkably be reduced by allowing the switching device to switch the exhaust gas flow path only when the unburned constituents are allowed to be released from the adsorbent material. As a result, the durability of the system can be improved.

Tanaka discloses an exhaust gas purifying method and apparatus for internal combustion engines. The exhaust gas purifying apparatus includes an internal combustion engine. As shown in Fig. 1, two exhaust pipes 2a and 2b are connected to engine 1 and are emerged into a single pipe. The exhaust pipes 2a and 2b are again separated into two exhaust pipes 8a and 8b. Each of the exhaust pipes 8a and 8b is

connected to a muffler 9a and 9b located on the rear side of the chassis. Catalysts 3a and 3b are provided in the two exhaust pipes 2a and 2b, respectively. An adsorbent sleeve 4 is provided at a portion in which the exhaust pipes 2a and 2b are merged into one downstream of the catalysts 3a and 3b. The interior of the adsorbent sleeve 4 is divided into two flow paths A and B, and the adsorbent for adsorbing hydrocarbon (HC) is provided in one of the flow paths. A zeolite system adsorbent 42 is provided in flow path A for adsorbing the hydrocarbon HC contained in the exhaust gas.

A bypass valve 40 selectively opens or closes the flow path A and the flow path B and is mounted in the outlet portion C of the adsorbent sleeve 4. The bypass valve 40 is connected through a lever 43 and a diaphragm chamber 41 mounted outside the adsorbent sleeve 4. The lever 43 rotates about a fulcrum 44. When the end of the lever 43 on the side of the diaphragm chamber 41 is lowered, the bypass valve 40 is lifted by the end portion of the lever 43 on the side of the bypass valve 40. This results in the flow path B being opened and the flow path A being closed. However, when the end of the lever 43 on the side of the diaphragm chamber 41 is lifted, the bypass valve 40 is lowered by the end portion of the lever 43 on the bypass valve 40. This results in the flow path A being open and the flow path B being closed.

The Office Action took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents in steps 402 through 406 and lines 28-37 of column 8, and Fig. 4 and 5. The Office Action further took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the bypass exhaust passage when the unburned constituents are released from the adsorbent

material at steps 404, 409 through 412, line 38 of column 8 to line 16 of column 9 and Fig. 6. The Office Action also took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed at steps 406, 412 through 414, and lines 17-52 of column 9.

However, in Tanaka, when the adsorbent material adsorbs, a gas flows through the gas flow path A (adsorbent side). When adsorbed material is released, most of the gas flows through the gas flow path B (bypass side). Further, when a fuel is cut off after the release of the adsorbed material, or when a gas being in lean condition, a gas flows through the gas flow path A (~~bypass~~ adsorbent? side). See col. 8, line 28 - col. 9, line 52.

Contrary to this, in the present invention, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, as recited in claim 1. As a result of this, in the present invention, deposits such as soot can be burned and removed from the adsorbent material. Furthermore, the frequency at which the switching device switches the exhaust gas flow path to either of the main exhaust passage and the bypass exhaust passage is reduced, thereby increasing the reliability of the switching device and improving the durability of the exhaust control system.

Therefore, as discussed above, Tanaka fails to disclose an exhaust emission control system wherein the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents are released from the adsorbent

material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed, as recited in claim 1.

Thus, it is respectfully submitted that the Applicants' invention, as set forth in claims 1, 4, 6 and 7, is not anticipated within the meaning of 35 U.S.C. § 102.

As claims 4, 6 and 7 depend directly or indirectly from claim 1, Applicants respectfully submit that each of these claims incorporate the patentable aspects thereof, and are therefore allowable for at least same reasons as discussed above.

Claims 1-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rao et al. (U.S. Patent No. 5,396,764, "Rao") in view of Tanaka. In making this rejection, the Office Action took the position that Rao discloses all the elements of the claimed invention, except for disclosing that the control device further switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed. Tanaka is cited for curing the deficiencies of Rao.

As will be discussed below, Applicants respectfully submit that claims 1-7 recite subject matter that is neither disclosed nor suggested by any combination of the prior art.

Rao discloses a spark ignition engine exhaust system. As shown in Fig. 1, engine 12 has exhaust manifolds 14 to direct the exhaust gases from the engine 12 to the exhaust system 10. The exhaust system 10 includes exhaust intake pipes 16 connected to the exhaust manifolds 14 and a catalytic converter 18 connected to the exhaust intake pipe 16. The other end of the catalytic converter 18 is connected to an exhaust pipe 20. The exhaust gases from the engine 12 flow through the exhaust

manifolds 14, exhaust intake pipes 16, catalytic converter 18 and exhaust pipe 20 to the atmosphere. As shown in Fig. 2, 4 and 5, the exhaust system 10 includes a bypass control mechanism 56 to direct gas flow to and away from the exhaust filter 30. The bypass control mechanism 56 includes a filter flange 58 connected to an inlet end of the exhaust filter 30. The bypass control mechanism 56 also includes a plate member 62 disposed adjacent to the inlet opening 34 and secured to the filter housing 32. In operation, upon cold starting of engine 12, the exhaust system 10 receives exhaust gases from the engine 12. At very low load conditions and very low temperatures, bellows 70 is in a contracted operational state such that control flange 66 blocks the aperture 60 of the filter flange 58. The exhaust gases flow through the central aperture 64 of the plate member and into bellows 70 and the filter flange 58. Since the apertures 60 are closed, the exhaust gases are forced to flow into the inlet end 40 of the first channels 44. The exhaust gases flow through the entire exhaust filter 30 and HC's are condensed and adsorbed or stored in the porous walls 42 on the inlet end of the exhaust filter 30.

The Office Action took the position that Rao discloses all the elements including wherein the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents at lines 10-24 of column 5 and Fig. 7. The Office Action also took the position that the control device switches the exhaust gas flow path to the bypass exhaust passage when the adsorbed unburned constituents are released from the adsorbent material at lines 31-62 of column 5 and Fig. 8.

However, Rao appears to only disclose an exhaust system, which has the bypass exhaust passage including annular passage, and fails to disclose or suggest wherein a control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, as recited in claim 1. As discussed above, in Tanaka, when adsorbed material is released, most of the gas flows through the gas flow path B (bypass side). Further, when a fuel is cut off after the release of the adsorbed material, or when a gas being in lean condition, a gas flows through the gas flow path A (bypass side). See col. 8, line 28 - col. 9, line 52.

Therefore, Applicants submit that Rao and Tanaka, either alone or in combination, fail to disclose or suggest

Thus, it is respectfully submitted that the Applicants' invention, as set forth in claims 1-7, is not obvious within the meaning of 35 U.S.C. § 103.

Still further, because claims 2-7 are dependent on claim 1, Applicants submit that that this claim recites subject matter that is neither disclosed nor suggested by the cited prior art, for at least the reasons set forth above with respect to claim 1.

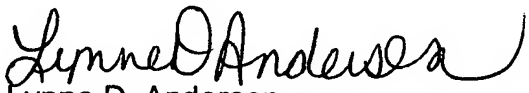
In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1-7, and the prompt issuance of a Notice of Allowability are respectfully solicited.

If this application is not in condition for allowance, the Examiner is requested to contact the undersigned at the telephone listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an

extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **r ferencing dock t number 107355-00052.**

Respectfully submitted,
ARENT FOX KINTNER PLOTKIN & KAHN PLLC



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Enclosures: Marked-up Copy of Specification
Marked-up Copy of Claim
Associate Power of Attorney

CMM:LDA/elz/ksm

MARKED-UP COPY OF SPECIFICATION

Please replace the paragraph bridging pages 1 and 2 with the following paragraph:

An exhaust emission control system disclosed in Japanese Patent Unexamined Application Hei. 9-324621 is known as a conventional exhaust emission control system of this type. This exhaust emission control system has an adsorbing device for adsorbing hydrocarbons which are unburned constituents. This adsorbing device is disposed downstream of a three-way catalyst in an exhaust pipe, and provided in the adsorbing device are two exhaust passages which branch from each other in the vicinity of an entrance and join together in the vicinity of an exit of the adsorbing device. An adsorbent material is provided in one of the exhaust passages (hereinafter, referred to as an "adsorbent material side passage") which is adapted to adsorb hydrocarbons and to release the hydrocarbons so adsorbed thereto as temperature increases. Additionally, a [switcable] switchable recirculation pipe for recirculating part of exhaust gas to an induction side of an engine is connected to the adsorbent material side passage downstream of the adsorbent material. Furthermore, a switching valve is provided where the adsorbent material side passage and the other exhaust passage (hereinafter, referred to as "the other passage") join together which is adapted to open one of the exhaust passages while closing the other thereof. This switching valve is driven to open the adsorbent material side passage when a vacuum is provided which is generated when the engine is in operation.

MARKED-UP COPY OF CLAIM

1. (Amended) An exhaust emission control system of an internal combustion engine for cleaning exhaust gases discharged from the internal combustion engine comprising:

[a] an exhaust system defining a main exhaust passage connected to an internal combustion engine, and a bypass exhaust passage which branches off and joins back to the main exhaust passage;

a switching device switching an exhaust gas flow path to either of the main exhaust passage and the bypass exhaust passage;

an adsorbent material disposed within the main exhaust passage for adsorbing unburned constituents of exhaust gases introduced into the main exhaust passage and releasing the unburned constituents as temperature increases; and

a control device operable to control the switching device,

wherein the control device switches the exhaust gas flow path to the main exhaust passage when the [absorbent] adsorbent material [absorbs] adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the [absorbed] adsorbed unburned constituents is released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the [absorbed] adsorbed unburned constituents is completed.